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06/10/2004

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3978

7590

05/05/2006

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EXAMINER

FLORES RUIZ, DELMA R

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 6/10/2004 have been considered by the examiner.

### ***Drawings***

The examiner has considered the drawings submitted on 06/10/2004.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1 - 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, the applicant recited: "the first linear polarizer (*if* the emission light from the gain medium is substantially polarized, this polarizer is not necessary)". This limitation is ambiguous it is not clear within the claim language if the

Art Unit: 2828

first linear polarizer is necessary or not necessary. ***Correction is required.***

Claims 1 - 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1 applicant recites "the etalon", this limitation is indefinite because it is not clear which etalon the applicant makes reference to, is it the retro-reflective etalon or is it the etalon filter. ***Correction is required.***

Claim 1 recites the limitation "the first linear polarizer", "the first quarter waveplate", "the etalon filter", "the second quarter waveplate", "the second linear polarizer", "the end mirror reflector" and "the etalon" in claim 1 part (a) and (d). There is insufficient antecedent basis for this limitation in the claim. ***Correction is required.***

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki (US 2003/0012250 A1) in view of Tobiasson et al. (US 2005/01505565 A1).

**Regarding claim 1**, Shirasaki discloses in Figure 7, an external cavity laser comprising: a gain medium (see Fig. 7, Character 506); a cavity phase adjustor (see Fig. 7, Character 510); a retro-reflective etalon comprising: (a) the first linear polarizer (if the emission light from the gain medium is substantially polarized, this polarizer is not necessary), (examiner understands that the limitation (first linear polarized) is one option therefore it does not take it in consideration), the first quarter waveplate (see Fig. 7, Character 604), the etalon filter (see Fig. 7, Character 204), the second quarter waveplate (see Fig. 7, Character 608), the second linear polarizer (see Fig. 7, Character 602), the end mirror reflector (see Fig. 7, Character 512); (b) the end reflector (see Fig. 7, Character 512) arranged in substantial or perfect parallel to the etalon filter (see Fig. 7, Character 204); (c) the optical axes of the two quarter waveplates (see Fig. 7, Characters 604 and 608) arranged in parallel or perpendicular; (d) the first quarter waveplate (see Fig. 7, Character 604) to rotate the polarization of the light reflected from the etalon (see Fig. 7, Character 204) and the first polarizer to absorb the light; (e) the second quarter waveplate (see Fig. 7, Character 608) to rotate the polarization of the light reflected from the etalon and the second polarizer (see Fig. 7, Character 602) to absorb the light; the light reflected back from the retro-reflective etalon being fed back into said gain medium (see Fig. 7, Character 506); the output light of the said laser from

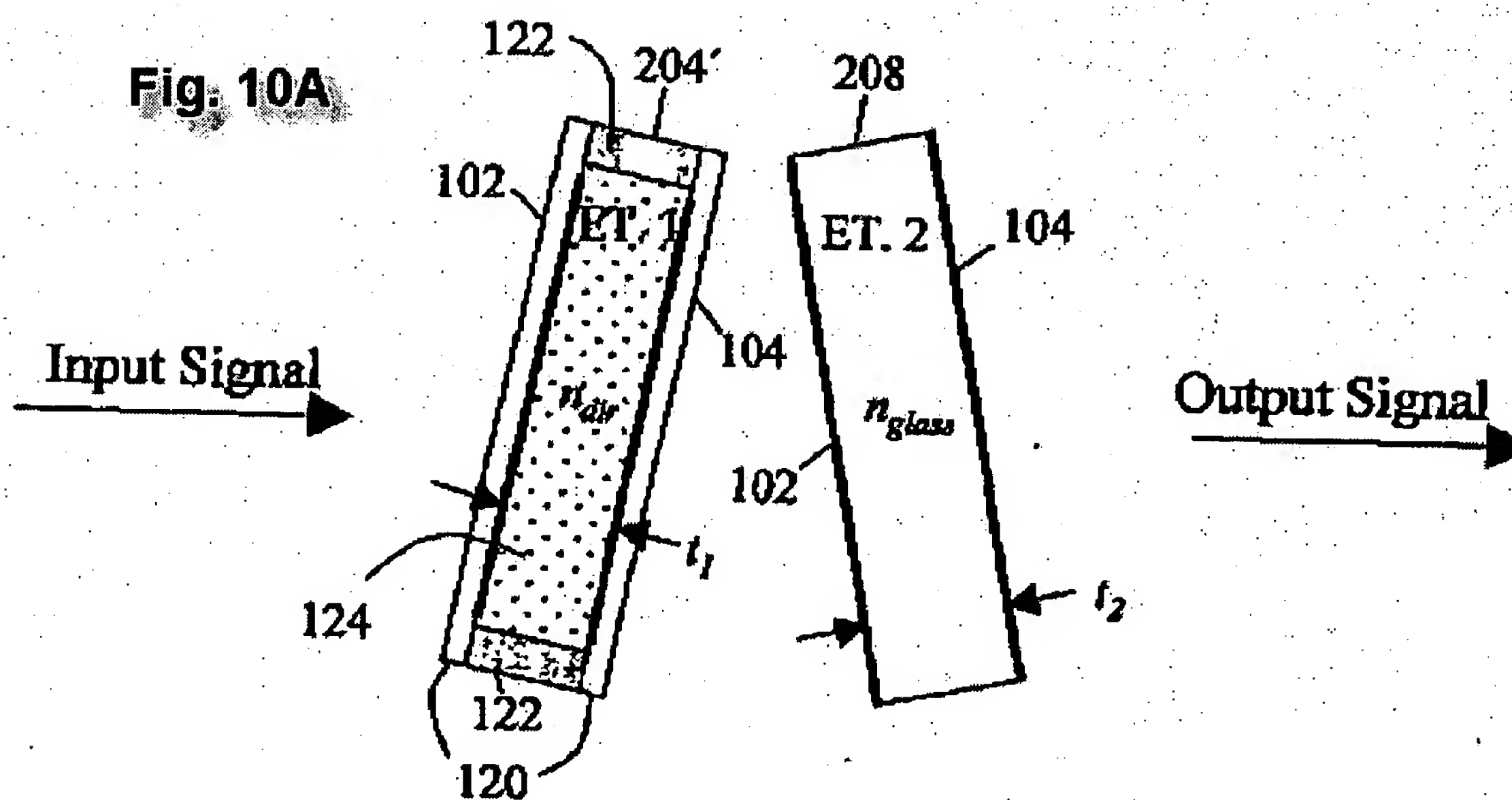
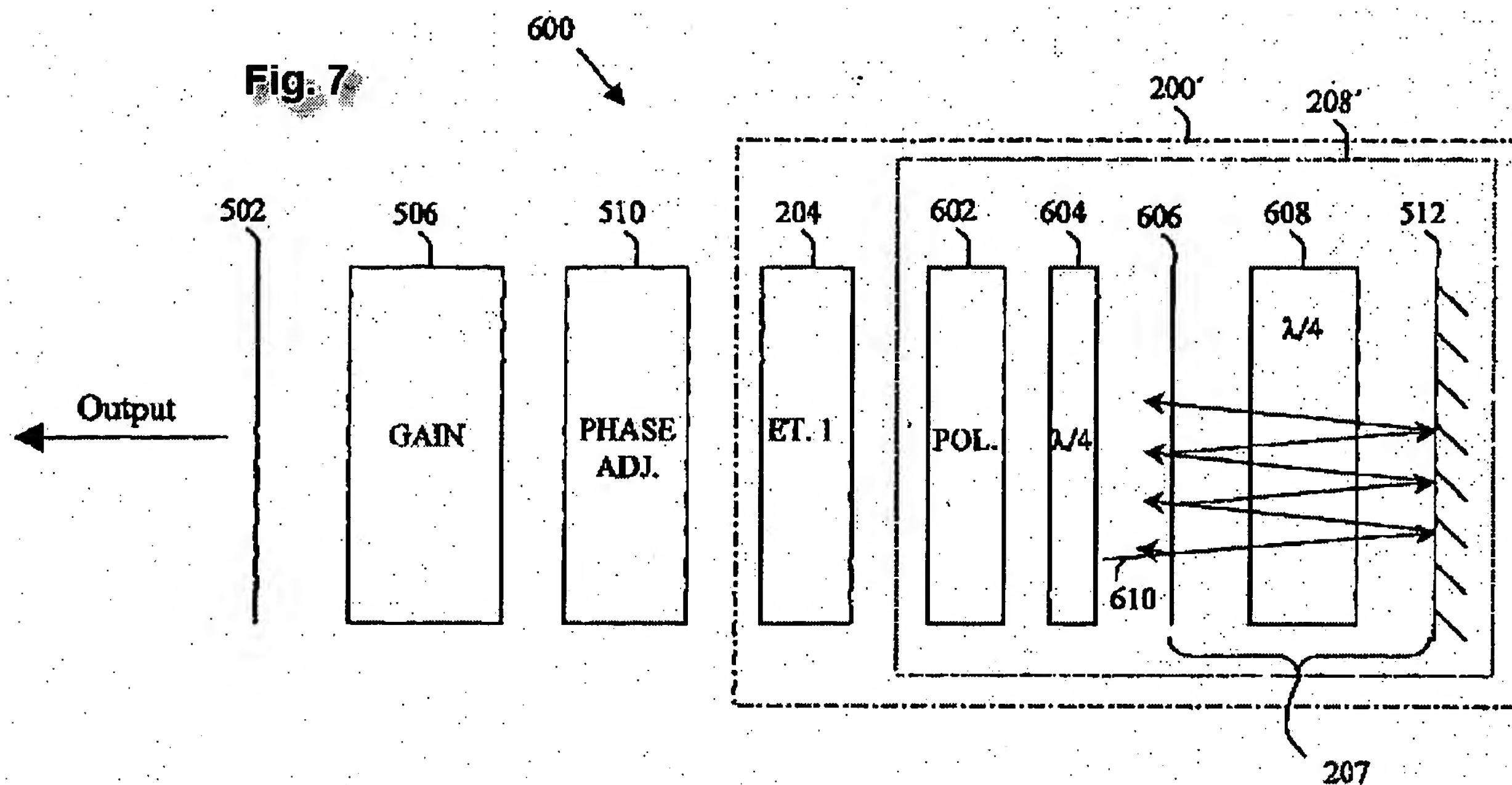
Art Unit: 2828

the end reflector (see Fig. 7, Character 512) of the retro-reflective etalon and the gain medium.

Shirasaki discloses the claimed invention except for a highly reflective facet and a highly transmissive facet. However, it is well known in the art to apply the highly reflective facet and a highly transmissive facet as disclosed by Tobiason in (Paragraph [0046]). Therefore, it would have been obvious to a person having ordinary skill in the art to apply the well known a highly reflective facet and a highly transmissive facet as suggested by Tobiason to the external cavity laser of Shirasaki, because it will be able to use a highly reflective facet and a highly transmissive facet to emitted light and The emitter facet carries a coating, which is, in various exemplary embodiments, an output coupler reflective coating, see Figure 1, characters 123 and 125 and Paragraph [0046] of Tobiason.

**Regarding claim 4**, Shirasaki discloses in Figure 7, the cavity phase adjustor (see Fig. 7, Character 510) is the means to adjust the cavity length to match the cavity mode(s) to the etalon peak(s) (Paragraph [0044] and abstract).

Figures 7 and 10A by Shirasaki.



**Regarding claim 5**, Shirasaki discloses in Figure 10A, wherein the etalon filter (see Fig. 10A Character 204') is an air-spaced etalon defined by a first partial reflector (see Fig. 10A Character 102) and a second partial reflector (see Fig. 10A Character 104), said reflectors mounted in a parallel spaced-apart (See Fig. 10A Character 124) relationship to form a gap in between.

**Regarding claim 6**, Shirasaki discloses in Figure 10A, wherein the etalon filter (see Fig. 10A Character 204') is defined by a first partial reflector (see Fig. 10A Character 102) and a second partial reflector (see Fig. 10A Character 104), said reflectors formed on the two parallel surfaces of a piece of transparent material. Shirasaki and Tobiason do not explicitly disclose the two parallel surfaces of a piece of *transparent material*. However, it was shown above Shirasaki and Tobiason teach a transparent material, e.g. the reflectors material is a glass. These material will inherently is transparent as claimed, and therefore limitations are taught by Shirasaki and Tobiason.

**Regarding claim 7**, Shirasaki discloses in Figures 9A, and 10A, wherein the optical path thickness of the transparent material (Shirasaki and Tobiason do not explicitly disclose the two parallel surfaces of a piece of *transparent material*. However, it was shown above Shirasaki and Tobiason teach a transparent material, e.g. the reflectors material is a glass. These material will inherently is transparent as claimed,



and therefore limitations are taught by Shirasaki and Tobiason.) can be changed thermally or by applying an electrical field or chosen thermally stable (Paragraphs [0049], [0051-0053]) .

**Regarding claim 8**, Shirasaki discloses in Figures 9A, and 10A, wherein the etalon filter is a thin film interference filter or a tapered thin film interference filter on a substrate of one transmission peak within a wavelength range defined by the requirement of single mode operation (Paragraph [0008] [0012-0013] and abstract.

**Regarding claim 9**, Shirasaki discloses in Figures 7, and 10A, wherein the linear polarizer only lets light with the polarization in parallel to its optical axis to pass through substantially (Paragraph [0046-0047]).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki (US 2003/0012250 A1) in view of Tobiason et al. (US 2005/01505565 A1), further in view of Bengoechea et al (US 2003/0095331 A1).

**Regarding claim 10**, Shirasaki in view of Tobiason discloses the claimed invention except for quarter waveplates are respectively made of a material selected from a group consisting of birefringent crystals and liquid crystals. However, it is well

know in the art to apply the quarter waveplates are respectively made of a material selected from a group consisting of birefringent crystals and liquid crystals as discloses by Bengoechea in Paragraph [0036]. Therefore, it would have been obvious to a person having ordinary skill in the art to apply the well know quarter waveplates are respectively made of a material selected from a group consisting of birefringent crystals and liquid crystals as suggested by Bengoechea to the external cavity laser of Shirasaki in view of Tobiason, because it will they are lighter, less expensive and more durable see Paragraph [0036] of Bengoechea.

### ***Allowable Subject Matter***

Claims 2, 3 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

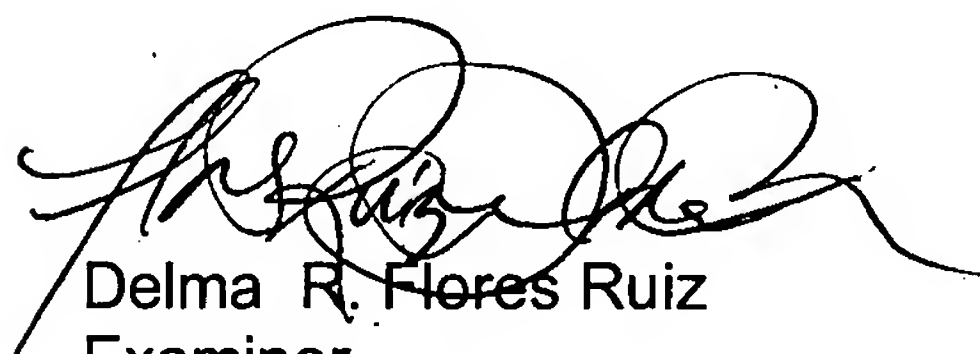
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (571) 272-1940. The examiner can normally be reached on M - F.

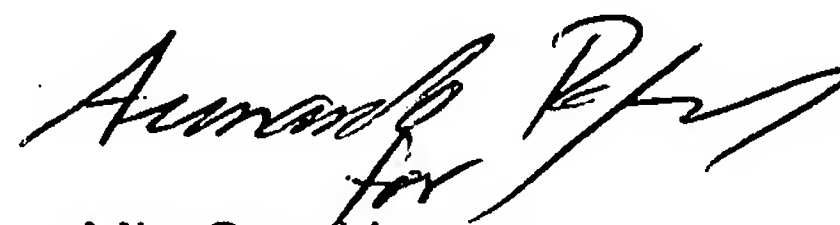
Art Unit: 2828

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) -272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Delma R. Flores Ruiz  
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April 27, 2006



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